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Stable Incretin Mimetics Counter Rapid Deterioration of Bone Quality in Type 1 Diabetes Mellitus.

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Résumé en anglais	**AIMS:** Type 1 diabetes mellitus is associated with a high risk for bone fractures. Although bone mass is reduced, bone quality is also dramatically altered in this disorder. However, recent evidences suggest a beneficial effect of the glucose-dependent insulinotropic polypeptide (GIP) and glucagon-like peptide 1 (GLP-1) pathways on bone quality. The aims of the present study were to conduct a comprehensive investigation of bone strength at the organ and tissue level; and to ascertain whether enzyme resistant GIP or GLP-1 mimetic could be beneficial in preventing bone fragility in type 1 diabetes mellitus. **MATERIALS AND METHODS:** Streptozotocin-treated mice were used as a model of type 1 diabetes mellitus. Control and streptozotocin-diabetic animals were treated for 21 days with an enzymatic-resistant GIP peptide ([D-Ala^2]GIP) or with liraglutide (each at 25 nmol/kg bw, ip). Bone quality was assessed at the organ and tissue level by microCT, qXRI, 3-point bending, qBEI, nanoindentation and Fourier-transform infrared microspectroscopy. **RESULTS:** [D-Ala^2]GIP and liraglutide treatment did prevent loss of whole bone strength and cortical microstructure in the STZ-injected mice. However, tissue material properties were significantly improved in STZ-injected animals following treatment with [D-Ala(2)]GIP or liraglutide. **CONCLUSIONS:** Treatment of STZ-diabetic mice with [D-Ala^2]GIP or liraglutide was capable of significantly preventing deterioration of the quality of the bone matrix. Further studies are required to further elucidate the molecular mechanisms involved and to validate whether these findings can be translated to human patients. This article is protected by copyright. All rights reserved.
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